

Docket No: BB-1462
Title: Fructosidase/synthetic Enzymes
Inventor: Stephen Allen, et. al.
Appl. No.: Unknown
E.I. DuPont de Nemours

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SEQ	ID	NO:	17
SEQ	ID	NO:	2
SEQ	ID	NO:	4
SEQ	ID	NO:	6

 YHMFYQYNPYAPVWGNMSTWGHHSVSKDMINWYELPVAMVPTEWYDIEGVLSGSTTVLPNGQ
 YHLFYQYNPYGPVWGNMSTWGHHSVSKDMINWFEELPVALVPTEWYDIEGVLSGSTTVLPNGQ
 YHLFYQYNPYAPVWGNMSTWGHHSVSKDMINWYELPVAVPTEWYDIEGVLSGSITVLPNGQ

FIG. 1A

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SEQ ID NO: 17 GPDGKHRMIMGTKRGNTGMVLVYYTTDYTYNELLDEPLHSVPNTDMWECDVFYPVSLTND
SEQ ID NO: 2 GPDGKHRMIMGSKRNKTGLVLVYHTTDFTNYVMSDEPLHSVPNTDMWECDVFYPVSLTND
SEQ ID NO: 4 GPDGKHRMIMGTKRGNTGMILVYHTTDYTNYEMLNEPMHSVPNTDMWECDVFYPVSLTND
SEQ ID NO: 6 GPDGKHRMIMGSKRGNTGMILVYHTTDYTNYELLDEPLHSVPNTDMWECDVFYPVSLTND
300

SEQ ID NO: 17 SALDMAAYGSGIKHVIKESWEGHGMWDWYSIGTYDAINDKWTTPDNPELDVGIGLRCDYGRF
SEQ ID NO: 2 SALDMAAYGSGIKHVIKESWEGHGMWDWYSIGTYDASTDKWTTPDNPKLDRKGTGTHLLHWVPE
SEQ ID NO: 4 SALDIAAYGSGIKHVIKESWEGYGMDFYSIGTYDAFNDKWTTPDNPELDVGIGLRCDYGRF
SEQ ID NO: 6 SALDMAAYGSGIKHVIKESWEGHGMWDWYSIGTYDAINDKWTTPDNPELDVGIGLRCDYGRF
360

SEQ ID NO: 17 FASKSLYDPLKKRITWGYVGESDSADQDLSRGWATVNVGRТИVLDRKRTGTHLLHWVPE
SEQ ID NO: 2 FASKSLFDPLKKRRTWGYVGESDKPDQDLSRGWATIYNVARTVVLDRKRTGTHLLHWVPE
SEQ ID NO: 4 FASKSIFDPVKKRITWAYVGESDNADDLDSRGWATIYNVGRТИVLDRKRTGTHLLHWVPE
SEQ ID NO: 6 FASKSLYDPLKKRRTWAYVGESDSVDQDLSRGWATVNVGRТИVLDRKRTGTHLLHWVPE
361

SEQ ID NO: 17 EVESSLRYNGQEFKEIKLEPGSIIPLDIGTATQLDIVATFEVDQAALNATSETDDIYGCCT
SEQ ID NO: 2 EIESLRSNGQEFNEIEIKPGSIIPLDIGSATQLDIVATFEVDQDALKAISETNEEYICTK
SEQ ID NO: 4 EIESLRYNGQEFKEIKLEPGSIAPLDIGTATQLDIVATFKVDEAALNATSETDDNFACTT
SEQ ID NO: 6 EVESSLRYNGQEFKEIELEPGSIIPLDIGTATQLDIVATFEVDQAALNATSETDDIYGCCT
361

SEQ ID NO: 17 EVESSLRYNGQEFKEIKLEPGSIIPLDIGTATQLDIVATFEVDQAALNATSETDDIYGCCT
SEQ ID NO: 2 EIESLRSNGQEFNEIEIKPGSIIPLDIGSATQLDIVATFEVDQDALKAISETNEEYICTK
SEQ ID NO: 4 EIESLRYNGQEFKEIKLEPGSIAPLDIGTATQLDIVATFKVDEAALNATSETDDNFACTT
SEQ ID NO: 6 EVESSLRYNGQEFKEIELEPGSIIPLDIGTATQLDIVATFEVDQAALNATSETDDIYGCCT
421

SEQ ID NO: 17 EVESSLRYNGQEFKEIKLEPGSIIPLDIGTATQLDIVATFEVDQAALNATSETDDIYGCCT
SEQ ID NO: 2 EIESLRSNGQEFNEIEIKPGSIIPLDIGSATQLDIVATFEVDQDALKAISETNEEYICTK
SEQ ID NO: 4 EIESLRYNGQEFKEIKLEPGSIAPLDIGTATQLDIVATFKVDEAALNATSETDDNFACTT
SEQ ID NO: 6 EVESSLRYNGQEFKEIELEPGSIIPLDIGTATQLDIVATFEVDQAALNATSETDDIYGCCT
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FIG. 1B

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Inventor: Stephen J. Allen, et. al.
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* * * * *
SEQ ID NO: 17 SLGAAQRGSILGPFGLAVIADGTLSELTpvYFYIAKKADGGVSTHFC
SEQ ID NO: 2 SWGAAGRGSILGPFGVAVIADGTLSELTpvYFYIAKNTDGSVATHFC
SEQ ID NO: 4 SSGAVERGSILGPFGLAVIADGTLSELTpvYFYIAKKADGGVSTHFC
SEQ ID NO: 6 SLGAAQRGSILGPFGLAVIADGTLSELTpvYFYIAKKADGGVSTHFC
481 540

* * * * *
SEQ ID NO: 17 VVYGGTVPVLDDEELTMRLLVVDHSIIVEGFAQQGRTVITSRAYPTKA
SEQ ID NO: 2 VVYGSTVPVLDGEELTMRLLVVDHSVVEGFAQQGRTVITSRVYPTKA
SEQ ID NO: 4 VVYGSTVPVLDDEELTMRLLVVDHSVVEAFAQQGRIATSRVYPTKA
SEQ ID NO: 6 VVYGSTVPVLDDEELTMRLLVVDHSIIVEGFAQQGRTVITSRVYPTKA
541 600

* * * * *
SEQ ID NO: 17 GTSVKASLKIWQMASAPIHQYPF-
SEQ ID NO: 2 GTSVKASLKIWQMASAPQIKPYPL-
SEQ ID NO: 4 DTSVKASLKIWQMASAQIHQYEFN
SEQ ID NO: 6 GTSVKASLKIWQMASAQIHQYSF-
601 624

FIG. 1C

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 Title: Fructosidase Synthetic Enzymes
 Inventor: Stephen Allen, et. al.
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<pre>***** SEQ ID NO: 21 MGSHGKPPLPYAYKPLPSDAADGKRTGCMRWSACATVLTASAMA VVVVGATLLAGLRMEQ SEQ ID NO: 8 ----- SEQ ID NO: 10 ----- SEQ ID NO: 12 ----- SEQ ID NO: 20 MASESSRR ----- RG DSTSTRR ----- RSGQEPLAVLVSAKNQSSEERAGGGLRV -- 1 60</pre>	<pre>***** SEQ ID NO: 21 AVDEEEAAAGGF PWNSNEMLQWQRSGYHFQTAKNYMSDPNGLMYYRGWYHMFQYNPVGTDW SEQ ID NO: 8 ----- SEQ ID NO: 10 ----- SEQ ID NO: 12 ----- SEQ ID NO: 20 --DEEAAAG-FPWNSNEMLQWQRSGYHFQTAKNYMSDPNGLMYYNGWYHMFQYNPVGTDW 1 61</pre>	<pre>***** SEQ ID NO: 21 DDGMEWGHAVSRNLVQWRTRILPIAMVA DQWYDILGVLSGSMTVLPNGTVIMIYTGATNASA SEQ ID NO: 8 --TRWGHAVSRNLVTRTRILPIAMVA DQWYDILGVLSGSMTVLPNGTVIMIYTGATNASA SEQ ID NO: 10 -----ARD----- SEQ ID NO: 12 -----DILGVLSGSMTVLPNGTVIMIYTGATNASA SEQ ID NO: 20 DDGMEWGHAVSRNLVTRTRILPIAMVA DQWYDILGVLSGSMTVLPNGTVIMIYTGATNASA 1 62</pre>	<pre>***** SEQ ID NO: 21 VEVQCIATPADPNDPFLRRWTKH PANPVIWSPPGVGTKDFRDPMTA WDESDETWRTLLG SEQ ID NO: 8 IEVQCIATPADPNDPFLRRWTKH PANPVIWSPPPGIGTKDFRDPMTA WDESDDTWRTLLG SEQ ID NO: 10 VEVQCIATPADPNDPFLRRWTKH PANPVIWSPPGIGTKDFRDPMTA WDESDDTWRTLLG SEQ ID NO: 12 ----- SEQ ID NO: 20 VEVQCIATPADPNDPFLRRWTKH PANPVIWSPPGIGTKDFRDPMTA WDESDDTWRTLLG 1 63</pre>
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FIG. 2A

240

F I D E O F = 2 6 E E 0 0 0

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SEQ ID NO: 21 SKDDDHGDGHHDGLAMMYKTKDFLNYELLIPGILHRVVRTGEWECIDFYPVGRRSSDNNSEML
SEQ ID NO: 8 SKDDQDGHHHDGLAMMYKTKDFLNYELLIPGILHRVVRTGEWECIDFYPVGRRSSDNNSEML
SEQ ID NO: 10 SKDDDHGDGHHDGLAMMYKTKDFLNYELLIPGILHRVQRTGEWECIDFYPVGHSNDNNSEML
SEQ ID NO: 12 -----
SEQ ID NO: 20 SKDDDHGDGHHDGLAMMYKTKDFLNYELLIPGILHRVQRTGEWECIDFYPVGHSNDNNSEML
300
241

SEQ ID NO: 21 HVLKASMDDERHDYYSLGTYDSAANTWTPIDPELDLGIGLRLRYDWGKFYASTSFYDPAKNR
SEQ ID NO: 8 HVLKASMDDERHDYYSLGTYDSAANTWTPIDPDLGLGIGLRLRYDWGKFYASTSFYDPAKKR
SEQ ID NO: 10 HVLKASMDDERHDYYSLGTYDSAANAAWTPIDPELDLGIGLRLRYDWGKFYASTSFYDPAKKR
SEQ ID NO: 12 -----
SEQ ID NO: 20 HVLKASMDDERHDYYSLGTYDSAANAAWTPIDPELDLGIGLRLRYDWGKFYASTSFYDPAKKR
360
301

SEQ ID NO: 21 RVLMGYVGEVDSKRADVVKGWASIQSVPRTVALDEKTRTNLLMPVEEETLRLNATELT
SEQ ID NO: 8 RVLMGYVGEVDSKRADVVKGWASIQSVPRTIALDEKTRTNLLMPVEEETLRLNATELS
SEQ ID NO: 10 RVLMGYVGEVDSKRADVVKGWASIQSVPRTIALDEKTRTNLLMPVEEETLRLNATELS
SEQ ID NO: 12 -----
SEQ ID NO: 20 RVLMGYVGEVDSKRADVVKGWASIQSVPRTIALDEKTRTNLLMPVEEETLRLNATELS
361
420

SEQ ID NO: 21 DVTINTGSVIHIPLRQGTQLDIEASFHLDASAVALNEADVGYNCCSSGGAVNRGALGPF
SEQ ID NO: 8 DVTMNTGSVIHIPLRQGTQLDIEATFHLDASAVALNEADVGYNCCSSGGAVNRGALGPF
SEQ ID NO: 10 DVTINTGSVIHIPLRQGTQLDIEATFHLDASAVALNEADVGYNCCSSGGAVNRGALGPF
SEQ ID NO: 12 -----
SEQ ID NO: 20 DVTINTGSVIHIPLRQGTQLDIEATFHLDASAVALNEADVGYNCCSSGGAVNRGALGPF
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480

FIG. 2B

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*****	GLIVLAAGDRRGEQTAVYFYVSRGLDGGLHTSFCQDELRSSRAKDVTKRVIGSTPVLDG	540
SEQ ID NO: 21	GLIVLAAGDRRGEQTAVYFYVSRGLDGGLHTSFCQDELRSSRAKDVTKRVIGSTPVLDG	
SEQ ID NO: 8	GLIVLAAGDRRGEQTAVYFYVSRGLDGGLHTSFCQDELRSSRAKDVTKRVIGSTPVLDG	
SEQ ID NO: 10	GLIVLAAGDRRGEQTAVYFYVSRGLDGGLHTSFCQDELRSSRAKDVTKRVIGSTPVLDG	
SEQ ID NO: 12	GLIVLAAGDRRGEQTAVYFYVSRGLDGGLHTSFCQDELRSSRAKDVTKRVIGSTPVLDG	
SEQ ID NO: 20	GLIVLAAGDRRGEQTAVYFYVSRGLDGGLHTSFCQDELRSSRAKDVTKRVIGSTPVLDG	
	481	
*****	EALSMRVLVDHSIVQGFDMGGRTTMSRVYPMESYQEAVYLVNNATGASVTAERLVVHE	541
SEQ ID NO: 21	EALSMRVLVDHSIVQGFDMGGRTTMSRVYPMEAYQEAKVYLFFNNATGASVMAERLVVHE	
SEQ ID NO: 8	EAFSMRVLVDHSIVQGFAAMGGRTTMSRVYPMEAYQEAKVYLFFNNATGASVMAERLVVHE	
SEQ ID NO: 10	EAFSMRVLVDHSIVQGFAAMGGRTTMSRVYPMEAYQEAKVYLFFNNATGASVMAERLVVHE	
SEQ ID NO: 12	-----ARATMTSRVYPMEAYQEAKVYLFFNNATGASVTAERLVVHE	
SEQ ID NO: 20	EAFSMRVLVDHSIVQGFAAMGGRTTMSRVYPMEAYQEAKVYLFFNNATGASVMAERLVVHE	
	541	
*****	MDSAHNQLSNEDDGMYLHQVLESRH	601
SEQ ID NO: 21	MDSAHNQLSNMDDYSYVQ-----	
SEQ ID NO: 8	MDSAHNQLSNMDDYSYVQ-----	
SEQ ID NO: 10	MDSAHNQLSNMDDHSYVQ-----	
SEQ ID NO: 12	MDSAHNQLSNMDDHSYVQ-----	
SEQ ID NO: 20	MDSAHNQLSNMDDHSYVQ-----	
	625	

FIG. 2C

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SEQ ID NO:18	MMASSTTTPLILHDDPENLPELTGSPTTRRLSIAKVLSGILVSLVIGALVALINNQTYESP-----	1	70
SEQ ID NO:14	MMASSTTTSPLLILHDDPENLQEPTGFTGVRPRTSIAKALCVTLLSVMVICGLVAVISNQTQVPQVANSHQG		
SEQ ID NO:16	MMASSTTTPLILHDDPENLPELTGSPTTRRLSIAKVLSGILVSLVLTCAVALVALINNQTYEPP-----		
	*****	1	
SEQ ID NO:18	SATTFVTQLPNIDLKRVPGKLDSAAEVWQRSTYHFQPDKNFISDPDGPMPYHMGWYHLYQYNPQSAIWG	61	140
SEQ ID NO:14	AATTFTTQLPKIDMKRVPGEELDSGADVQWQRSAYHFQPDKNYISDPDGPMPYHMGWYHLYQYNPESAIWG		
SEQ ID NO:16	AATTFAATQLPNIDLKRVPGKLDSAAEVWQRSAAYHFQPDKNFISDPDGPMPYHMGWYHLYQYNPESAIWG		
	*****	61	
SEQ ID NO:18	NITWGHHSVSKDMINWFHLPFAMVPDHWDYDIEGVMTGSATVLPNGQIIMLYSGNAYDLSQVQCLAYAVNSS	141	210
SEQ ID NO:14	NITWGHHSVSKDMINWFHLPFAMVPDHWDYDIEGVMTGSATVLPNGEIIMLYTGNGAYDLSQVQCLAYAVNSS		
SEQ ID NO:16	NITWGHHSVSKDMINWFHLPFAMVPDHWDYDIEGVMTGSATVLPNGQIIMLYTGNGAYDLSQVQCLAYAVNSS		
	*****	141	
SEQ ID NO:18	DPLLIEWKKYEGNPVLLPPPVGYKDFRDPSTLWSGPDGEYRMVMGSKHNETIGCALLYHTTNFTHFELK	211	280
SEQ ID NO:14	DPLLIEWKKYEGNPVLLPPPVGYKDFRDPSTLWLGPDGEYRMVMGSKHNETIGCALLYHTTNFTHFELK		
SEQ ID NO:16	DPLLIEWKKYEGNPVLFPPPGVGYKDFRDPSTLWLGPDGEYRMVMGSKHNETIGCALLYHTTNFTHFELK		
	*****	211	
SEQ ID NO:18	EEVLHAVPHTGMWECDLVPVSTVHTNGLDMVDNGPNVKYVLQSGDEDRHDWYAIGSYDIVNDKWYPDD	281	350
SEQ ID NO:14	EEVLHAVPHTGMWECDLVPVSTTHTNGLDMVDNGPNVKYVLQSGDEDRHDWYAIGSYDWVNNDKWYPDD		
SEQ ID NO:16	EEVLHAVPHTGMWECDLVPVSTVHTNGLDMVDNGPNVKYVLQSGDEDRHDWYAIGSYDWVNNDKWYPDD		
	*****	281	

FIG. 3A

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SEQ ID NO :18	PENDVGIGLRYDFGKFYASKTIFYDQHKKKRRLWGYGETDPQKYDLSKGWANILNI PRTVVLIDLETFKTNLIQ	351	422
SEQ ID NO :14	PENDVGIGLRYDGKFYASKTIFYDQHKKKRRLWGYGETDPQKYDLTKGWANILNI PRTVVLDTKTKTNLIQ		
SEQ ID NO :16	PENDVGIGLRYDFGKFYASKTIFYDQHKKKRRLWGYGETDPQKYDISKGWANILNI PRTVVLDTKTKTNLIQ		
	423	494	566
SEQ ID NO :18	WPIEEETENLRSSKKYDEFKDVELRPGALVPLEIGTATQLDIVATFELDQKMLESTLEADVLFNCTTSEGSVAR		
SEQ ID NO :14	WPIEEETEKLRSKKYDKFVDVELRPGSLIPLLEIGTATQLDIVATFEDQMMLESTLEADVLFNCTTSEGVGR		
SEQ ID NO :16	WPIEEETENLRSSKTYDEFKDVELRPGSLVPLEIGTATQLDIVATFELDQKMLESTLEADVLFNCTTSEGSVAR		
	495	567	637
SEQ ID NO :18	SVLGPFGVVVLA DAQRSEQEQLPVYFYIAKDI DGTSRTYFCADETRSSKDVSVGKWWVGSSVPVLPGEKYNMRL		
SEQ ID NO :14	GVLGPFGVVVLA DAQRTEQLPVYFYIAKDTDGTSRTYFCADETRSSKDVVGKWWVGSSVPVLPNEKYNMRL		
SEQ ID NO :16	GALGPFGVVVLADAQRSEQEQLPVYFYIAKDI DGTSRTYFCADETRSSKDVSVGKWWVGSSVPVLPGEKYNMRL		
	564	638	
SEQ ID NO :18	LVDHSIVEGFAQN GRTVVT SRVYPTKAI YNAAK VELNNATG ISVKASIKIWKMGAEELNPFPPLPGWT FEL		
SEQ ID NO :14	LVDHSIVEGFAQN GRTVVT SRVYPTKAI YNAAK VELNNATGIRVKASVKIWKMAEAELNPFPVTGWT S--		
SEQ ID NO :16	LVDHSIVEGFAQN GRTVVT SRVYPTKAI YNAAK VELNNATG ISVKASIKIWKMAKAELNPFPPLPGWT FEL		
	564	638	

FIG. 3B